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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/810,023

03/26/2004

Zhaofu Hu

8416

25859 7590 04/16/2007

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EXAMINER

CANNING, ANTHONY J

ART UNIT

PAPER NUMBER

2879

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/16/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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**Office Action Summary**

Application No.

10/810,023

Applicant(s)

HU ET AL.

Examiner

Anthony J. Canning

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 18, 20 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 18, 20 and 22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 28 March 2007 has been entered.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Jones et al. (U.S. 5,548,181).

4. Regarding claims 1, 18 and 20, Jones et al. disclose a barrier array (see Fig. 74, item 115; column 13, lines 31-26) for use in a flat panel display (see Fig. 106b; column 21, lines 11-13) including: a shadow mask (see Fig. 74, items 120 and 122; column 13, lines 21-26) defining a plurality of openings (see Fig. 74, item 118; column 13, lines 15-16; this pixel opening is for an individual field emitter but there are pixel openings for each field emitter shown in figure 106b) therethrough according to a predetermined pattern (see Fig. 74, item 118; column 13, lines 15-16; this pixel opening is for an individual field emitter but there are pixel openings for each field

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emitter shown in figure 106b), the predetermined pattern being in accordance with a pixel pattern of a flat panel display (see Fig. 74; column 13; lines 10-20; the pixel cavity is the opening corresponding to the pixel pattern), the shadow mask having an upper (see Fig. 74, item 120; column 13, lines 21-26; the portion of 120 closest to the top of the page) and lower surface (see Fig. 74, item 122; column 13, lines 21-26; the portion of 122 closest to the bottom of the page) and an insulative layer (see Fig. 74, item 121; column 13, lines 21-23) including a first portion layer directly formed on the upper surface of the shadow mask (see Fig. 74, item 121; column 13, lines 21-23; the portion of item 121 closest to the top of the page), a plurality of second portions (see Fig. 74, item 121; column 13, lines 21-23; the portion of 121 that has a slope and descends through the pixel cavity 118), and a third portion directly formed on the lower surface of the shadow mask (see Fig. 74, item 121; column 13, lines 21-23; the portion of item 121 closest to the bottom of the page), the second portions disposed in the respective openings and connecting the first portion with the third portion (see Fig. 74, item 121; the portion that descends through the pixel opening connects the portion of item 121 closest to the top of the page and the portion of item 121 that is closest to the bottom of the page).

5. Regarding claim 3, Jones et al. disclose the barrier array as described in claim 1. Jones et al. further disclose the insulative layer comprises alumina or magnesia (column 13, lines 21-23; specifically magnesia).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4, 5 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (U.S. 5,548,181).

8. As to claims 4, 5 and 22, Jones et al. disclose the barrier array as described in claims 3 and 18. Jones et al. fail to disclose that the thickness of the insulative layer being between 10-500  $\mu\text{m}$ . However, to establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range. *In re Hill*, 284 F.2d 955, 128 USPQ 197 (CCPA 1960). An affidavit or declaration under 27 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a *prima facie* case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979). "A comparison of the *claimed* invention with the disclosure of each cited reference to determine the number of claim limitations in common with each reference, bearing in mind the relative importance of particular limitations, will usually yield the closest single prior art reference." *In re Merchant*, 575 F.2d 865, 868, 197 USPQ 785, 787 (CCPA 1978) (emphasis in original). Where the comparison is not identical with the reference disclosure, deviations therefrom should be explained, *In re Finley*, 174 F.2d 130, 81 USPQ 383 (CCPA 1949), and if not explained should be noted and evaluated, and if significant, explanation should be required. *In re Armstrong*, 280 F.2d 132, 126 USPQ 281 (CCPA 1960) (deviations from the example were inconsequential).

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (U.S. 5,548,181) in view of Lee et al. (U.S. 6,508,685 B1; of record).

10. As to claim 2, Jones et al. disclose the barrier array as described in claim 1. Jones et al. fail to specifically disclose the shadow mask is made from a material selected from the group including: an iron-nickel alloy, low carbon steel, and another suitable metal alloy; and the material has a coefficient of thermal expansion matching that of a substrate of the flat panel display.

In the same field of endeavor, Lee et al. disclose a barrier array (see Fig. 6, item 52; column 5, lines 37-40), wherein the shadow mask (see Fig. 7, item 52; column 5, lines 37-40) is made from a material selected from the group including: an iron-nickel alloy, low carbon steel, and another suitable metal alloy (column 5, lines 37-40; these are metal alloys, and any metal may be chosen); and the material has a coefficient of thermal expansion matching that of a substrate of the flat panel display (column 5, lines 37-40; these are metal alloys, and any metal may be chosen which can match the thermal expansion of the substrate of the display device). Lee et al. further disclose that these materials increase the reflectivity of visible light (column 5, lines 40-41), choosing a material that matches the thermal expansion coefficient of the substrate will reduce damage to the device due to the operation temperature of the device.

Therefore, it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to modify the barrier array of Jones et al. to include that the shadow mask is made from a material selected from the group including: an iron-nickel alloy, low carbon steel, and another suitable metal alloy; and the material has a coefficient of thermal expansion matching that of a substrate of the flat panel display, as taught by Lee et al., to increase the

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reflectivity of visible light and to reduce damage to the device caused by the operation temperature of the device.

***Response to Arguments***

11. Regarding the applicant's argument that the first and third portion of the insulative layer is not formed on the upper and lower surface of the shadow mask respectively, the examiner notes that since there are not structural limitations that distinguish the shadow mask as claimed over the prior art of record, the examiner interprets items 120 and 122 in figure 74 of Jones et al. as a shadow mask and the insulative layer, item 121, is formed directed on the upper and lower surface of the shadow mask.

***Contact Information***

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony J. Canning whose telephone number is (571)-272-2486. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh D. Patel can be reached on (571)-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anthony Canning *ac*  
Patent Examiner  
Art Unit 2879  
6 April 2007

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